



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: § Atty. Dkt. No.: 041443-00752
Eva Ackerman and Randy Gene Clark §
Serial No.: 09/764,572 § Group Art Unit: 2831
Filed: January 18, 2001 § Examiner: Patel, Dhirubhai R.
For: A Method of Assisting a §
Compromised Barrier §

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER 37 C.F.R. §1.131 OF RANDY CLARK

This Declaration Under 37 C.F.R. §1.131 serves to establish invention of the subject matter set forth in the claims of U.S. patent application serial no. 09/764,572, filed on January 18, 2001 in the United States on a date prior to the effective date of U.S. Patent No. 6,521,834 B1 ("Dykhoff"), which has been cited by the Examiner in the above-referenced Proceeding.

I, Randy Clark, do hereby declare and state that:

1. I am an inventor of the above-identified patent application;
2. I am currently employed by The RectorSeal Corporation, the assignee of record of the above-referenced application;
3. I have been involved in the firestopping industry for over twenty (20) years and have a thorough understanding of firestop systems. In addition, I have participated in the development of, establishment of, and revisions to industry standards relating to firestopping requirements for building codes. During that time, I have been active in various trade

organizations, including the National Fire Protection Association (NFPA), Southern Building Code Congress International (SBCCI), International Conference of Building Officials (ICBO), Building Officials and Code Administrators International (BOCA) and Construction Specifications Institute (CSI). I have served as President for two terms for the International Firestop Council (IFC) and was appointed by Underwriter's Laboratory (UL) as a member of its Standards Technical Panel (STP). I have also participated on E-05, Fire Standards, and E-06, Performance of Buildings, subcommittees of the American Society for Testing and Materials (ASTM).

4. From 1984 to 1990, I was engaged in the firestopping industry having formed the firestopping consulting firm of R. G. Clark and Associates in San Antonio, Texas, in 1986. During 1990-1993, I worked for two manufacturers of firestopping systems, serving as the Northeast Regional Sales Manager (Hevi-Duty Nelson Corporation) and Manager of Technical Services (International Protective Coatings) where my responsibilities included testing, product development and technical assistance.

5. In 1993, I became the Manager of Technical Services for The RectorSeal Corporation in Houston, Texas, and have been involved in the management of the UL® certified fire test facility as well as product development. Presently, I serve as Manager of Firestop Technologies for the International Department.

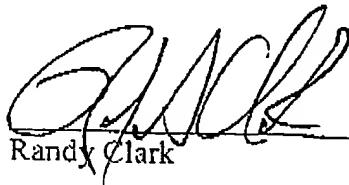
6. The effective date of *Dykhoff* is no earlier than August 25, 2000. The invention in the above-referenced patent application was reduced to practice earlier than August 25, 2000.

7. To establish the reduction to practice of the invention in the U.S. set forth in the above-referenced patent application prior to August 25, 2000, I hereby submit, as attached, Exhibit A (with dates blacked out), a copy of a redacted e-mail to me from Richard N. Walke of

UL Laboratories wherein Mr. Walke discusses testing (prior to August 25, 2000) of devices having a fire protection gasket behind a plastic or steel cover plate of an electrical outlet box. The composition of the intumescent gasket containing graphite is referenced in redacted Exhibit B (with dates prior to August 25, 2000, blacked out). The results of the testing F0419029, referenced in Exhibit A, are reported in redacted Exhibit C (with dates prior to August 25, 2000, blacked out), wherein F0419029 2hr refers to a 2-hour maximum rated barrier having an intumescent gasket rated for 2 hours. Such barrier's rating has been reestablished for 2 hours. The testing of Exhibit C was conducted prior to August 25, 2000, and the results were compiled in Exhibit C prior to August 25, 2000. Exhibit D is a copy of the laboratory testing report (with dates prior to August 25, 2000, blacked out) reporting the results of our laboratory testing for the F0419029 tests. Similar testing using BlazeSeal, an intumescent product of The RectorSeal Corporation, is shown in Exhibit E (with dates prior to August 25, 2000, blacked out). All of the testing set forth (and reported) in Exhibits A through E was conducted in the United States.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

DATED: 30 March '04


Randy Clark

Randy Clark

Randy,

One item we were planing to take care of last week but didn't was the size of the "gasket" to be utilized as fire protection behind cover plates of outlet boxes.

According to my notes, there have been two successful tests of gaskets. The first test was F0419029. It utilized plastic cover plates. The second test was F0420037. It used steel cover plates.

During my [redacted] visit to RectorSeal, I obtained samples of the gaskets used with the plastic cover plates in Test F0419029. The size of

the gasket was as follows:

~~-----~~ The gasket was 1.5 mm thick and
was made from the 4X intumescent material.

Thanks for your assistance.

Rich Walke

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Issued: [REDACTED]

DESCRIPTION

PRODUCT COVERED:

USC, CNC Electrical box inserts [REDACTED]
[REDACTED]
[REDACTED]

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

CNC indicates investigation to Canadian Standard CAN4-S115M.

MANUFACTURING PROCESS:

BASE INTUMESCENT SHEET

The material is blended in the proportions described below:

<u>Material</u>	<u>Percent Composition by Weight</u>
Hydrated Aluminum Silicate	
Acid Treated Flake Graphite	

RNW/DJK:bam
NKDLS

F041902~~2~~ hr Metal 3 5/8" Metal 4 11/16" Standard Metal Pass

RECTORSEAL

Company Name:
Address/Phone:

Wall Furnace
T/C & Pressure Taps Locations

File No.

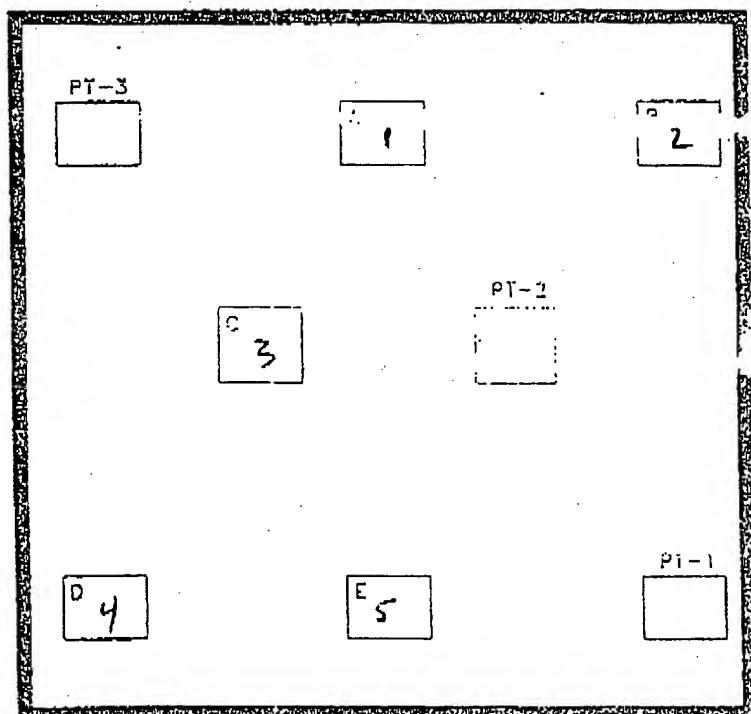
Project 4 1/16" box, Metal Plate, Plastic Plate, black seal

Test Date

Test No. 029

Test Standard E0419029.xls

1. 1-a
2. 2-b
3. 3-c
4. 4-d
5. 5-e
- 6.
- 7.
- 8.
- 9.
- 10.



FRONT

#18 failed at 1:45
#16 failed at 1:50

PASSED

INSTRUMENT CALIBRATION

Instr.

I.D.

Date Last Calb.

Date of Next Calb.

Hose Stream Gauge
Setra (Pressure Tap)

- 1.
- 2.
- 3.
- 4.

T/C Reading(Computer)
Furnace T/C's
Relative Humidity Meter

EXHIBIT D

Testing of 1.5mm BlazeSeal electrical plate covers

Test Date	Foil Tape?	Face Plates	Study Type	Test Length	Test Result
■■■■■	Yes	Plastic	Metal	2 hour	Pass
■■■■■	Yes	Metal	Metal	2 hour	Pass

Last Updated
JES ■■■■■



Designation: E 814 - 88^{e1}

Standard Test Method for Fire Tests of Through-Penetration Fire Stops¹

This standard is issued under the fixed designation E 814; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (e) indicates an editorial change since the last revision or reapproval.

^{e1} Note—Paragraph 1.5 was corrected editorially in June 1993.

INTRODUCTION

Characteristically fire spreads from one building compartment to another by the collapse of a barrier, or by openings through which flames or hot gases may pass, or by transfer of sufficient heat to ignite combustibles beyond the barrier. Test Methods E 119 describe the method to be used to measure the fire-resistive performance of these barriers.

However, various techniques of providing for the distribution of services within a structure sometimes require that openings be made in fire-resistive walls and floors to allow the passage of such penetrating items as cables, conduits, pipes, trays, and ducts through to the adjacent compartment. Fire-stop material is installed into these openings to resist the spread of fire.

The performance of through-penetration fire stops should be measured and specified according to a common standard that describes the method of fire exposure and rating criteria.

1. Scope

1.1 This test method is applicable to through-penetration fire stops of various materials and construction. Fire stops are intended for use in openings in fire-resistive walls and floors that are evaluated in accordance with Test Methods E 119.

1.2 Tests conducted in conformance with this test method will record fire-stop performance during the test exposure; but such tests shall not be construed to determine suitability of the fire stop for use after test exposure.

1.3 This test method considers the resistance of fire stops to an external force stimulated by a hose stream. However, this test method shall not be construed as determining the performance of the fire stop during actual fire conditions when subjected to forces such as failure of cable support systems and falling debris.

1.4 The intent of this test method is to develop data to assist others in determining the suitability of the fire stops for use where fire resistance is required.

1.5 This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions and should not be used to describe or appraise the fire-hazard or fire-risk of materials, products, or assemblies under actual fire conditions. However, results of the test may be used as elements of a fire-hazard assessment or a fire-risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.

1.6 This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Document

2.1 ASTM Standard:

E 119 Test Methods for Fire Tests of Building Construction and Materials²

3. Terminology

3.1 Definition:

3.1.1 *fire stop*—a through-penetration fire stop is a specific construction consisting of the materials that fill the opening around penetrating items such as cables, cable trays, conduits, ducts, and pipes and their means of support through the wall or floor opening to prevent spread of fire.

3.2 Descriptions of Terms Specific to This Standard:

3.2.1 *test specimen*—the fire stop being tested.

3.2.2 *test assembly*—the wall or floor into which the test specimen(s) is (are) mounted or installed.

4. Summary of Test Method

4.1 This method of testing through-penetration fire stops exposes fire stops to a standard temperature-time fire, and to a subsequent application of a hose stream.

4.2 Ratings are established on the basis of the period of resistance to the fire exposure, prior to the first development of through openings, flaming on the unexposed surface, limiting thermal transmission criterion, and acceptable performance under application of a hose stream.

¹ This method is under the jurisdiction of Committee E-5 on Fire Standards and is the direct responsibility of Subcommittee E05.11 on Building Construction.

Current edition approved Oct. 31, 1988. Published February 1989. Originally published as E 814 - 81. Last previous edition E 814 - 83.

² Annual Book of ASTM Standards, Vol 04.07.

5. Significance and Use

5.1 This test method is used to determine the performance of a fire stop with respect to exposure to a standard temperature-time fire test and hose stream test. The performance of a fire stop is dependent upon the specific assembly of materials tested including the number, type, and size of penetrations and the floors or walls in which it is installed.

5.2 Two ratings are established for each fire stop. An *F* rating is based upon flame occurrence on the unexposed surface, while the *T* rating is based upon the temperature rise as well as flame occurrence on the unexposed side of the fire stop. These ratings, together with detailed performance data such as the location of through-openings and temperatures of penetrating items are intended to be one factor in assessing performance of fire stops.

6. Control of Fire Tests

6.1 *Temperature-Time Curve*—The fire environment within the furnace shall be in accordance with the standard temperature-time curve shown in Fig. 1. The points on the curve that determine its character are:

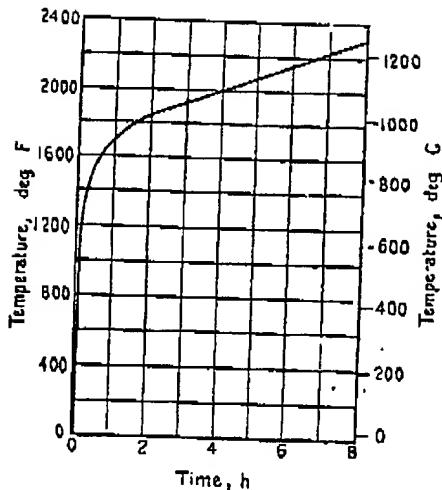
Ambient at 0 min
1000°F(538°C) at 5 min
1300°F(704°C) at 10 min
1550°F(843°C) at 30 min
1700°F(927°C) at 60 min
1850°F(1010°C) at 120 min
2000°F(1093°C) at 240 min
2300°F(1260°C) at 480 min or over

6.2 Furnace Temperatures:

6.2.1 The temperature fixed by the curve shall be the average temperature obtained from the readings of thermocouples symmetrically disposed and distributed within the test furnace to show the temperature near all parts of the assembly. Use a minimum of three thermocouples, with not fewer than five thermocouples per 100 ft² (9.29 m²) of floor surface, and not fewer than nine thermocouples per 100 ft² of wall specimen surface.

6.2.2 Enclose the thermocouples in sealed protection tubes of such materials and dimensions that the time constant of the protected thermocouple assembly lies within the range³ from 300 to 400 s. The exposed length of the pyrometer tube and thermocouple in the furnace chamber shall be not less than 12 in. (300 mm). Other types of protection tubes of pyrometers may be used provided that temperature measurements obtained in accordance with Fig. 1 are within the limit of accuracy that applies for furnace temperature measurements.

6.2.3 For floors, place the junction of the thermocouples 12 in. (300 mm) away from the exposed face of the assembly. In the case of walls, place the thermocouples 6.0 in. (150 mm) away from the exposed face.



NOTE—For a closer definition of the temperature-time curve, see Annex A1.
FIG. 1 Temperature-Time Curve

6.2.4 Read the temperature at intervals not exceeding 5 min during the first 120 min. Thereafter, the intervals may be increased to not more than 10 min.

6.2.5 The accuracy of the furnace control shall be such that the area under the temperature-time curve, obtained by averaging the results from the pyrometer or thermoelectric device readings, is within 10 % of the corresponding area under the standard temperature-time curve shown in Fig. 1 for fire tests of 60 min or less duration; within 7.5 % for those over 60 min and not more than 120 min; and within 5 % for tests exceeding 120 min in duration.

6.3 Unexposed Surface Temperatures:

6.3.1 Make at least one measurement at each of the following locations on the unexposed surface of the test sample and floor or wall assembly as shown in Fig. 2.

6.3.2 Additional temperature measurements may be made at the discretion of the testing agency to obtain representative information on the performance of the fire stops.

6.3.3 Measure temperatures on the surface of the fire stop and assembly with thermocouples placed under flexible pads specified in Annex A2. The pads shall be held firmly against the surface and shall fit closely about the thermocouples. The thermocouple junction shall be located under the center of the pads. The thermocouple leads under the pads shall be not heavier than No. 18 B and S gage (0.040 in.) (1.02 mm) and shall be electrically insulated with heat-resistant moisture-resistant coverings.

6.3.4 Measure temperatures of each type and size of penetrating item with at least one thermocouple located 1.0 in. (25.4 mm) from the unexposed surface of the fire-stop material. The thermocouple bead shall be held firmly against the penetrating item. The thermocouple leads shall not be heavier than No. 22 B and S gage (0.025 in.) (0.635 mm) and shall be electrically insulated with heat-resistant and moisture-resistant coverings. The pads as described above shall be held firmly against the penetrating item and shall fit closely about the thermocouples.

³ A typical thermocouple meeting these time-constant requirements may be fabricated by fusion-welding the twisted ends of No. 18 B and S gage (0.040 in.) (1.02 mm) Chromel-Alumel wires, mounting the leads in porcelain insulators and inserting the assembly so the thermocouple bead is 0.50 in. (13 mm) from the sealed end of a standard weight, nominal 1/4-in. iron, steel, or Inconel pipe. (Inconel is a trademark of Inco Alloys, Inc., 3800 Riverside Dr., P.O. Box 1958, Huntington, WV 25720.) The time constant for this and for several other thermocouple assemblies was measured in 1976. The time constant may also be calculated from knowledge of its physical and thermal properties. See Research Report RR:EOS-1001, available from ASTM Headquarters.

Standard Test Methods for Fire Tests of Building Construction and Materials¹

This standard is issued under the fixed designation E 119; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which was adopted by the Department of Defense.

²*NOTE—Paragraph 1.3 and 47.1.1 were corrected editorially in June 1993.*

INTRODUCTION

The performance of walls, columns, floors, and other building members under fire exposure conditions is an item of major importance in securing constructions that are safe, and that are not a menace to neighboring structures nor to the public. Recognition of this is registered in the codes of many authorities, municipal and other. It is important to secure balance of the many units in a single building, and of buildings of like character and use in a community; and also to promote uniformity in requirements of various authorities throughout the country. To do this it is necessary that the fire-resistive properties of materials and assemblies be measured and specified according to a common standard expressed in terms that are applicable alike to a wide variety of materials, situations, and conditions of exposure.

Such a standard is found in the methods that follow. They prescribe a standard exposing fire of controlled extent and severity. Performance is defined as the period of resistance to standard exposure elapsing before the first critical point in behavior is observed. Results are reported in units in which field exposures can be judged and expressed.

The methods may be cited as the "Standard Fire Tests," and the performance or exposure shall be expressed as "2-h," "6-h," "1/2-h," etc.

When a factor of safety exceeding that inherent in the test conditions is desired, a proportional increase should be made in the specified time-classification period.

1. Scope

1.1 These test methods are applicable to assemblies of masonry units and to composite assemblies of structural materials for buildings, including bearing and other walls and partitions, columns, girders, beams, slabs, and composite slab and beam assemblies for floors and roofs. They are also applicable to other assemblies and structural units that constitute permanent integral parts of a finished building.

1.2 It is the intent that classifications shall register performance during the period of exposure and shall not be construed as having determined suitability for use after fire exposure.

¹ These test methods are under the jurisdiction of ASTM Committee E-5 on Fire Standards and are the direct responsibility of Subcommittee E05.11 on Building Construction.

Current edition approved April 29, 1988. Published August 1988. Originally published as C 19 - 1917 T. Last previous edition E 119 - 87.

These test methods, of which the present standard represents a revision, were prepared by Sectional Committee A2 on Fire Tests of Materials and Construction, under the joint sponsorship of the National Bureau of Standards, the ANSI Fire Protection Group, and ASTM, functioning under the procedure of the American National Standards Institute.

1.3 This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions and should not be used to describe or appraise the fire-hazard or fire-risk of materials, products, or assemblies under actual fire conditions. However, results of the test may be used as elements of a fire-hazard assessment or a fire-risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.

NOTE 1—A method of fire hazard classification based on rate of flame spread is covered in Test Method E 84.

1.4 The results of these tests are one factor in assessing fire performance of building construction and assemblies. These test methods prescribe a standard fire exposure for comparing the performance of building construction assemblies. Application of these test results to predict the performance of actual building construction requires careful evaluation of test conditions.

1.5 This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

C 569 Test Method for Indentation Hardness of Pre-formed Thermal Insulations²
 E 84 Test Method for Surface Burning Characteristics of Building Materials³

3. Significance and Use

3.1 This test method is intended to evaluate the duration for which the types of assemblies noted in 1.1 will contain a fire, or retain their structural integrity or exhibit both properties dependent upon the type of assembly involved during a predetermined test exposure.

3.2 The test exposes a specimen to a *standard fire exposure* controlled to achieve specified temperatures throughout a specified time period. In some instances, the *fire exposure* may be followed by the application of a *specified standard fire* hose stream. The exposure, however, may not be representative of all fire conditions which may vary with changes in the amount, nature and distribution of fire loading, ventilation, compartment size and configuration, and heat sink characteristics of the compartment. It does, however, provide a relative measure of fire performance of comparable assemblies under these specified fire exposure conditions. Any variation from the construction or conditions (that is, size, method of assembly, and materials) that are tested may substantially change the performance characteristics of the assembly.

3.3 The test standard provides for the following:

3.3.1 In walls, partitions, and floor or roof assemblies:
 3.3.1.1 Measurement of the transmission of heat.
 3.3.1.2 Measurement of the transmission of hot gases through the assembly, sufficient to ignite cotton waste.
 3.3.1.3 For load bearing elements, measurement of the load carrying ability of the *test specimen* during the test exposure.

3.3.2 For individual load bearing assemblies such as beams and columns: Measurement of the load carrying ability under the test exposure with some consideration for the end support conditions (that is, restrained or not restrained).

3.4 The test standard does not provide the following:

3.4.1 Full information as to performance of assemblies constructed with components or lengths other than those tested.

3.4.2 Evaluation of the degree by which the assembly contributes to the fire hazard by generation of smoke, toxic gases, or other products of combustion.

3.4.3 Measurement of the degree of control or limitation of the *passage of smoke* or products of combustion through the assembly.

3.4.4 Simulation of the fire behavior of joints between building elements such as floor-wall or wall-wall, etc., connections.

3.4.5 Measurement of flame spread over surface of tested element.

3.4.6 The effect of fire endurance of conventional open-

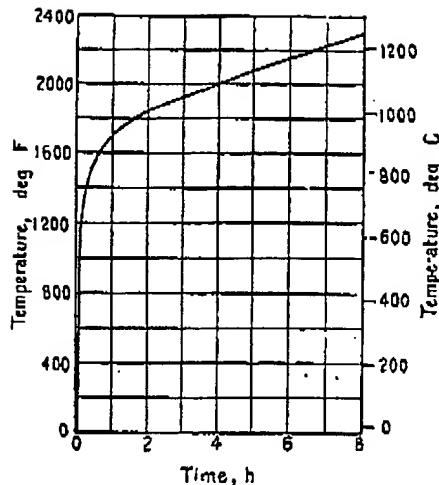


FIG. 1 Time-Temperature Curve

ings in the assembly, that is, electrical receptacle outlets, plumbing pipe, etc., unless specifically provided for in the construction tested.

CONTROL OF FIRE TESTS

4. Time-Temperature Curve

4.1 The conduct of fire tests of materials and construction shall be controlled by the standard time-temperature curve shown in Fig. 1. The points on the curve that determine its character are:

1000°F (538°C)	at 5 min
1300°F (704°C)	at 10 min
1550°F (843°C)	at 30 min
1700°F (927°C)	at 1 h
1850°F (1010°C)	at 2 h
2000°F (1093°C)	at 4 h
2300°F (1260°C)	at 8 h or over

4.2 For a closer definition of the time-temperature curve, see Appendix X1.

Note 2—Recommendations for Recording Fuel Flow to Furnace Burners—The following provides guidance on the desired characteristics of instrumentation for recording the flow of fuel to the furnace burners. Fuel flow data may be useful for a furnace heat balance analysis, for measuring the effect of furnace or control changes, and for comparing the performance of assemblies of different properties in the fire endurance test.⁴

Record the integrated (cumulative) flow of gas (or other fuel) to the furnace burners at 10 min, 20 min, 30 min, and every 30 min thereafter or more frequently. Total gas consumed during the total test period is also to be determined. A recording flow meter has advantages over periodic readings on an instantaneous or totalizing flow meter. Select a measuring and recording system to provide flow rate readings accurate to within $\pm 5\%$.

Report the type of fuel, its higher (gross) heating value, and the fuel flow (corrected to standard conditions of 60°F (16°C) and 30.0 in. Hg) as a function of time.

⁴ Harmathy, T. Z., "Design of Fire Test Furnaces," *Fire Technology*, Vol. 5, No. 2, May 1969, pp. 146-150; Siegel, L. G., "Effects of Furnace Design on Fire Endurance Test Results," *Fire Test Performance, ASTM STP 464*, ASTM, 1970, pp. 57-67; and Williamson, R. B., and Buchanan, A. H., "A Heat Balance

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